



NMDCAT

FULL LENGTH PAPER-2

QUARTER SYLLABUS - 2

Total MCQs: 200

Max. Marks: 200

BIOLOGY

- Q.1 Procedure which helps to eliminate or reduce possibility of infection is called:**
A) Anti-inflammatory process C) Vaccination
B) Antisepsis D) Antiseptics
- Q.2 All of the following are related to cell wall of Gram positive bacteria except:**
A) Contain only one layer C) More permeable
B) Periplasmic space present in all D) Contain teichoic acid
- Q.3 _____ retain the primary dye due to formation of _____.**
A) *Mycoplasmas*, CV-I complex C) Gram negative, CV-I complex
B) Gram positive, CV-I complex D) Archeobacteria, CV-I complex
- Q.4 In S-type *Pneumococci*, capsule is chemically made of:**
A) Proteins only C) Both polysaccharide and proteins
B) Polysaccharides only D) Polysaccharides and lipids
- Q.5 It is not present in cytoplasmic matrix of bacteria?**
A) Mesosomes C) Ribosomes
B) Granules D) Microtubules
- Q.6 Which of the following is analogous to the mesosomes of bacteria?**
A) Lysosomes of eukaryotes C) Peroxisomes of eukaryotes
B) Mitochondria of eukaryotes D) Chromatin of eukaryotes
- Q.7 These are chemotherapeutic agents that work with our defense system against bacteria:**
A) Disinfectants C) Preservatives
B) Vaccines D) Antibiotics
- Q.8 Gamma rays are commonly used for:**
A) Disinfection C) Sterilization
B) Antisepsis D) Pasteurization
- Q.9 _____ is a large group of parasitic protozoa.**
A) Amoebae C) Zooflagellates
B) Apicomplexans D) Ciliates
- Q.10 Protozoans are known as animal-like protists because:**
A) They are eukaryotic C) They are unicellular
B) They are ingestive heterotrophs D) They are structurally similar to animals
- Q.11 One which forms monophyletic lineage with green algae and plants?**
A) Brown algae C) Red algae
B) Euglenoids D) Dinoflagellates
- Q.12 Most primitive of all eukaryotes belong to which group?**
A) Bacteria C) Protozoa
B) Amoeba D) Algae
- Q.13 Fusion of egg and sperm of *Plasmodium* during its life cycle occurs in:**
A) Gut of mosquito C) RBCs of human
B) Salivary glands of mosquito D) Liver of human
- Q.14 Special kind of genetic recombination called parasexuality is actually exchange of genetic material between:**
A) Two nuclei of different hyphae C) Two nuclei of same hyphae
B) Two hyphae of different organisms D) Two nuclei of different species
- Q.15 Dormant and thick walled structure which is produced by direct fusion of hyphae is:**
A) Zygospore C) Ascospore
B) Basidiospore D) Spore



- Q.16** Fungi consists of long, slender, branched tubular thread like filaments called:
- A) Mycelia C) Haustoria
B) Hyphae D) Trichome
- Q.17** The haploid capsule that produces spores in *Rhizopus* is:
- A) Conidiospore C) Sporangium
B) Basidium D) Sporangophore
- Q.18** All of the following are related to *Aspergillus* except:
- A) Used for fermentation C) Used to obtain cyclosporine
B) Used to obtain citric acid D) Used to form soya sauce
- Q.19** In *Rhizopus*, zygospore divides through:
- A) Mitosis only C) Meiosis followed by mitosis
B) Meiosis only D) Mitosis followed by meiosis
- Q.20** All of these show ecological importance of fungi except:
- A) Decomposition C) Genetic engineering
B) Bioremediation D) Recycling
- Q.21** Group of fungi in which karyogamy takes place immediately after plasmogamy is:
- A) Zygomycota C) Basidiomycota
B) Ascomycota D) Deuteromycota
- Q.22** It is obtained from a soil fungus and is used to prevent transplant rejection:
- A) Lovastatin C) Ergotone
B) Cyclosporine D) Griseofulvin
- Q.23** All of the following roles are related to yeast except:
- A) Role in biological research C) Role in genetic engineering
B) Role in fermentation industry D) Role in textile industry
- Q.24** Fungal enzymes can break all of the following cell wall components except:
- A) Cellulose C) Chitin
B) Lignin D) Cutin
- Q.25** Migraine can be treated by using:
- A) Lovastatin C) Cyclosporine
B) Penicillin D) Ergotin
- Q.26** In humans superficial fungal infections are caused by certain:
- A) Sac-like fungi C) Conjugating fungi
B) Club-shaped fungi D) Imperfect fungi
- Q.27** Nervous spasm, convulsion, psychotic delusion and gangrene are result of swallowing:
- A) Brown ergot contaminated rye flour C) Green ergot contaminated rye flour
B) Purple ergot contaminated rye flour D) Redergot contaminated rye flour
- Q.28** *Aspergillus fumigatus* causes:
- A) Candidosis C) Aspergillosis
B) Histoplasmosis D) Candidiasis
- Q.29** *Saccharomyces cerevisiae* is most common exploited:
- A) Yeast C) Lichen
B) Fungi D) Moss
- Q.30** _____ fungus is used for genetic research.
- A) *Neurospora* C) *Haemophilus influenza*
B) *Arabidopsis* D) *Morchella*
- Q.31** All of the following are true for all plants except:
- A) They develop from embryo C) They show alternation of generation
B) Sporophyte is dominant generation D) They have chlorophyll 'a'
- Q.32** Which group of bryophytes can equally grow well in fairly dry places?
- A) Bryopsida C) Hepaticopsida
B) Anthocerotopsida D) Psilopsida
- Q.33** Which of the following true structure is present in *Psilotum*?
- A) Leaves C) Stem
B) Roots D) Flowers



- Q.34 Which of the following is first adaptation that led to the formation of megaphyll?
A) Dichotomous branching
B) Overtopping
C) Planation
D) Formation of veins
- Q.35 Megaspore in seed producing plants germinate to produce:
A) Embryo
B) Pollen grain
C) Embryo sac
D) Male gametophyte
- Q.36 Terminal part of carpel, designed to receive pollens is called:
A) Stigma
B) Ovary
C) Style
D) Anther
- Q.37 Double fertilization is characteristic feature of:
A) Angiosperms
B) Tracheophytes
C) Gymnosperms
D) Bryophytes
- Q.38 A flower is a modified:
A) Root
B) Leaf
C) Shoot
D) Seed
- Q.39 One which cannot be used as differentiating feature between monocots and dicots?
A) Number of cotyledons
B) Relative position of ovary
C) Patterns of veins in leaves
D) Presence or absence of wood
- Q.40 Reshuffling of genes occurs during which phase/process of alternation of generation:
A) Gametogenesis
B) Asexual reproduction
C) Diploid sporophyte formation
D) Sporogenesis
- Q.41 An organism is known as animal if it has all of following properties except:
A) Eukaryotic
B) Heterogamy
C) Unicellular or multicellular
D) Ingestive heterotrophs
- Q.42 All the animals placed in grade radiata are:
A) Diploblastic and acoelomates
B) Diploblastic and coelomates
C) Triploblastic and acoelomates
D) Triploblastic and coelomates
- Q.43 Radial symmetry is present in:
A) Sycon
B) Hydra
C) Cockroach
D) Human
- Q.44 The phylum whose members are mostly endoparasites is:
A) Platyhelminthes
B) Annelida
C) Arthropoda
D) Mollusca
- Q.45 Function of suckers cells in *Fasciola* is:
A) Reproduction
B) Absorb nutrients
C) Locomotion
D) Defense
- Q.46 Sleeping sickness is caused by:
A) Trypanosoma
B) Plasmodium
C) Giardia
D) Amoeba
- Q.47 Common housefly is involved in spread of all except:
A) Hepatitis
B) Malaria
C) Dysentery
D) Cholera
- Q.48 It is not derived from endoderm?
A) Liver
B) Pancreases
C) Stomach
D) Muscles
- Q.49 Metamerism is found in:
A) *Ascaris*
B) Leech
C) Loligo
D) Octopus
- Q.50 It is an example of free living platyhelminthes:
A) *Dugesia*
B) Liver fluke
C) Tape worm
D) Blood fluke
- Q.51 It is not a germ layer:
A) Ectoderm
B) Mesoderm
C) Endoderm
D) Blastoderm



- Q.52 The cylindrical body of a sea anemone can be cut in two equal halves. It represents:
A) Diploblastic organization C) Radial symmetry
B) Triploblastic organization D) Bilateral symmetry
- Q.53 All of the following insects are beneficial except:
A) Locust C) Silk worm
B) Honey bee D) Butterfly
- Q.54 Tube like digestive system was first time appeared in:
A) Porifera C) Platyhelminthes
B) Coelentrata D) Nematoda
- Q.55 Only flatworm having segmented body is?
A) Tapeworm C) Liver fluke
B) Planaria D) Earthworm
- Q.56 In deuterostomes mesoderm is derived from wall of developing?
A) Coelom C) Schizocoelous
B) Archenteron D) Margin of blastopore
- Q.57 Respiration occurs through organs like gills, book lungs or tracheal system found in phylum:
A) Mollusca C) Arthropoda
B) Annelida D) Echinodermata
- Q.58 A highly developed nervous system is present in:
A) Porifera C) Cnidaria
B) Arthropods D) Platyhelminthes
- Q.59 It is not true about pseudocoelomate:
A) Homologous to coelom
B) Develops from the blastocoel of embryo
C) Have space between body wall and digestive tube
D) Circular muscles are absent
- Q.60 First invertebrate to develop a nervous system is:
A) Sponge C) Cnidarian
B) Flat worm D) Round worm

CHEMISTRY

- Q.61 An electrochemical cell has two half cell reactions as
 $A^{2+} + 2e^- \rightarrow A$ $E^\circ = +0.34V$
 $X^{2+} + 2e^- \rightarrow X$ $E^\circ = +2.37V$
 The cell voltage will be
 A) 2.71 V C) -2.71 V
 B) 2.03 V D) -2.03 V
- Q.62 If the rate of reaction is doubled by doubling [A] and rate is also doubled by doubling [B], then overall order of reaction is $A+B \rightarrow P$
 A) 3 C) 1
 B) 2 D) Zero
- Q.63 Which of the following equilibrium constant shows that the reaction go almost to completion?
 A) $K_c = 10^{16}$ C) $K_c = 10^{-6}$
 B) $K_c = 10^3$ D) $K_c = 10^{-12}$
- Q.64 Maximum number of moles of oxygen gas that can be obtained by electrolytic decomposition of 90g of water will be
 A) 1.0 C) 2.5
 B) 2.0 D) 9.0
- Q.65 The lowest ionization energy is possessed by group _____ elements
 A) VII A C) II A
 B) VIII A D) I A
- Q.66 The units of rate constant for first order reaction are
 A) $\text{moles} \cdot \text{dm}^{-3} \cdot \text{s}^{-1}$ C) s^{-1}
 B) $\text{dm}^3 \cdot \text{mol}^{-1} \cdot \text{s}^{-1}$ D) $\text{dm}^6 \cdot \text{mol}^{-2} \cdot \text{s}^{-1}$



- Q.67 All of the following metals lie below the SHE except
A) Ni^{+2} C) Fe^{+3}
B) Cu^{+1} D) Hg^{+2}
- Q.68 The yield of NH_3 in the reaction
 $\text{N}_2 + 3\text{H}_2 \rightleftharpoons 2\text{NH}_3$ $\Delta H = -46.2 \text{ kJ/mol}$ is affected by
A) Change in pressure and temperature
B) Change in temperature and conc. of H_2
C) Change in pressure and conc. of N_2
D) Change in pressure, temperature and conc. of N_2
- Q.69 When pressure is applied to equilibrium system
 $\text{ice} \rightleftharpoons \text{water}$
Which of the following phenomenon will happen?
A) More ice will be formed C) More water will be formed
B) Water will be evaporated D) Equilibrium will not be disturbed
- Q.70 If the electronegativity difference b/w two atoms is zero then the bond is
A) Polar covalent bond C) Ionic bond
B) Non-polar covalent bond D) Co-ordinate covalent bond
- Q.71 Boiling point of water is higher than benzene because IMF in water are
A) Weaker than benzene C) Same as in benzene
B) Stronger than benzene D) Negligible
- Q.72 _____ reactions will be favoured by increase in pressure at equilibrium
A) $\text{H}_2 + \text{I}_2 \rightleftharpoons 2\text{HI}$ C) $\text{N}_2 + 3\text{H}_2 \rightleftharpoons 2\text{NH}_3$
B) $\text{PCl}_5 \rightleftharpoons \text{PCl}_3 + \text{Cl}_2$ D) $\text{N}_2\text{O}_4 \rightleftharpoons 2\text{NO}_2$
- Q.73 The products of electrolysis of dilute aqueous sodium nitrate are
A) Na and O_2 C) H_2 and O_2
B) H_2 and NO_2 D) Na and NO_2
- Q.74 pH of buffer solution containing 0.1M CH_3COOH and 1M CH_3COONa ($\text{pK}_a = 4.74$)
A) 5.74 C) 3.74
B) 4.74 D) 2.74
- Q.75 If an exothermic reaction is allowed to take place very rapidly in the air. The temperature of the system
A) Remains constant C) Decreases
B) Increases D) First decreases then increases
- Q.76 60 kJ mol^{-1} is the activation energy for the forward reaction $\text{X} \rightarrow \text{Z}$ $\Delta H = -20 \text{ kJ mol}^{-1}$. The activation energy for the reverse reaction will be
A) 40 kJ mol^{-1} C) 80 kJ mol^{-1}
B) 50 kJ mol^{-1} D) 20 kJ mol^{-1}
- Q.77 Percentage covalent bond character in PH_4^+ is
A) 25% C) 50%
B) 75% D) 80%
- Q.78 Whenever a reaction is exothermic, then it means that:
A) The heat is transferred from system to the surrounding
B) Heat is transferred from surrounding to the system
C) The wall of vessel become cool
D) Heat content of the reactants is less than those of products
- Q.79 First law of thermodynamics relates
A) Heat, work and entropy C) Heat, work and external energy
B) Internal energy, heat and work D) Work, internal energy and enthalpy
- Q.80 The standard enthalpy changes occur at:
A) 25°C and 2 atm C) 25°C and 1 mm Hg
B) 298 K and 1 atm D) 273 K and 1 atm
- Q.81 Heat of neutralization of a strong acid and strong base is $-57.0 \text{ kJ mol}^{-1}$, the enthalpy change of 0.5mole HNO_3 with 0.5 mole KOH will be
A) -57.0 kJ C) -28.5 kJ
B) -11.4 kJ D) -17.1 kJ



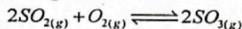
- Q.82** Which one of the ΔH_f° indicates that the product is least stable
A) -94 kJmol^{-1} C) $+94 \text{ kJmol}^{-1}$
B) $-393.7 \text{ kJmol}^{-1}$ D) $+21.4 \text{ kJmol}^{-1}$
- Q.83** The pH of 10^{-3} M solution of $\text{M}(\text{OH})_2$ If 50% dissociated
A) 3 C) 11.3
B) 11 D) 2.7
- Q.84** In which of the following compounds, oxidation state of Oxygen is +1?
A) H_2O_2 C) F_2O_2
B) H_2O D) BaO_2
- Q.85** In Bomb calorimeter, crucible of _____ element used for combustion
A) Iron C) Lead
B) Copper D) Platinum
- Q.86** Which option shows all the molecule with bond angle less than 109.5°
A) AlCl_3 , H_2S , NH_3 C) H_2O , H_2S , NF_3
B) NH_3 , H_2O , SO_3 D) CO_2 , NF_3 , BF_3
- Q.87** For reaction, $\text{rate} = k[\text{A}]^2[\text{B}]^1$. If rate is 0.04, concentration of A is 0.2 and concentration of B is unity the value of rate constant would be
A) $0.05 \text{ mol dm}^{-3} \text{ sec}^{-1}$ C) $0.5 \text{ mol}^{-2} \text{ dm}^{-6} \text{ sec}^{-1}$
B) $1 \text{ mol}^{-2} \text{ dm}^{-6} \text{ sec}^{-1}$ D) 2 sec^{-1}
- Q.88** Which of the following reaction has fractional order
A) Formation of tertiary alcohol from alkyl halide
B) Reaction of ozone with nitric oxide
C) Formation of glucose in presence of sunlight
D) Reaction of Cl_2 with chloroform.
- Q.89** Which of the following reaction is feasible
A) $\text{Cu} + \text{Zn}^{+2} \longrightarrow \text{Zn} + \text{Cu}^{+2}$ C) $\text{Br}_2 + \text{I}^{-1} \longrightarrow \text{I}_2 + 2\text{Br}^{-1}$
B) $\text{Cl}_2 + 2\text{F}^{-1} \longrightarrow \text{F}_2 + 2\text{Cl}^{-}$ D) $\text{Fe} + \text{Zn}^{+2} \longrightarrow \text{Zn} + \text{Fe}^{+2}$
- Q.90** Which of the following reaction is the fastest?
A) Rusting of iron
B) Burning of sulphur
C) Reaction of CH_4 and Cl_2
D) Precipitation of BaSO_4 by mixing two solution
- Q.91** The specific rate constant for a first order reaction depends on the
A) Time C) Temperature
B) Concentration of reactant D) Concentration of product
- Q.92** A reaction has rate law expression as
 $\text{Rate} = k[\text{A}]^{3/2} [\text{B}]^{-1/2}$
The order of reaction is
A) 1 C) 3.2
B) 2 D) -1/2
- Q.93** The chemical reactions in which reactants require higher amount of activation energy are generally
A) Slow C) Instantaneous
B) Fast D) Spontaneous
- Q.94** The rate of reaction increases with increase in temperature, this is mainly because of
A) Increase in collision frequency
B) Change in mechanism
C) Decrease in activation energy
D) Increase in the effective collisions
- Q.95** If E_f and E_b are the activation energies of the forward and reverse reactions and the reaction is known to be exothermic, when
A) $E_f < E_b$ C) $E_f = E_b$
B) $E_f > E_b$ D) Cannot be predicted



- Q.96** Point out the false statement
A) A catalyst does not differentiate between the forward and backward reaction
B) Low E_a is associated with fast reaction
C) A catalyst can change equilibrium constant
D) The activated state represents highly unstable state
- Q.97** Most of the catalysts belong to the
A) Inner transition metals
B) Normal metals
C) Outer transition metals
D) All of these
- Q.98** In which of the following reaction, $K_p > K_c$
A) $N_2 + 3H_2 \rightleftharpoons 2NH_3$
B) $H_2 + I_2 \rightleftharpoons 2HI$
C) $PCl_3 + Cl_2 \rightleftharpoons PCl_5$
D) $2SO_3 \rightleftharpoons 2SO_2 + O_2$
- Q.99** According to Le-Chatelier's principle, supplying heat to a solid and liquid in equilibrium will cause the
A) Amount of solid to decrease
B) Amount of liquid to decrease
C) Temperature to rise
D) Temperature to fall
- Q.100** What is oxidation state of chlorine in $Mg(ClO_2)_2$
A) -1
B) +3
C) +1
D) +5
- Q.101** For the feasibility of a redox reaction in a cell, the EMF should be
A) Positive
B) Fixed
C) Zero
D) Negative
- Q.102** An element of VIIA forms strongest acid in which it is in its highest oxidation state. The element is highly soluble in water, it is
A) F_2
B) Br_2
C) Cl_2
D) I_2
- Q.103** Which of the following molecule has highest dipole moment
A) CO
B) CO_2
C) SO_2
D) H_2O
- Q.104** Lattice energy of NaCl is -787 kJ/mol and ΔH_f is -411 what is ΔH_x for NaCl
A) -1198 kJ/mol
B) -376 kJ/mol
C) +1198 kJ/mol
D) +376 kJ/mol
- Q.105** Enthalpy of solution of sodium carbonate is -25 kJ/mol is the process is
A) Spontaneous & exothermic
B) Spontaneous & endothermic
C) Non-spontaneous & exothermic
D) Non-spontaneous & endothermic
- Q.106** $Ca(OC)Cl$ chlorine has oxidation state of
A) ± 1
B) ± 5
C) ± 3
D) ± 7
- Q.107** Study the following redox reaction
 $2MnO_4^- + 3C_2O_4^{2-} + 4H_2O \longrightarrow 2MnO_2 + 6CO_2 + 8OH^-$
In this reaction change in oxidation state of carbon is
A) +3 to +4
B) -4 to +2
C) +4 to +2
D) None
- Q.108** The potential difference of an electrochemical cell can be measured by using
A) Ammeter
B) Galvanometer
C) Volt meter
D) Calorimeter
- Q.109** In Voltaic cell a salt bridge is used, which contains an aqueous solution of ___ in a gel
A) NaOH
B) KCl
C) KOH
D) NH_4Cl
- Q.110** X and Y have reduction potential values as -0.75V and -1.35V respectively. The cell voltage or emf of the cell is
A) +2.10V
B) -0.60V
C) -2.10V
D) +0.60V
- Q.111** In Haber's process _____ can be used as promotor.
A) Cr_2O_3
B) MgO
C) Al_2O_3
D) All of these



- Q.112 A buffer solution is that which resist the change in
 A) pK_a C) pK_b
 B) pOH D) pH
- Q.113 Which of the following mixture will form acidic buffer
 A) HCl and $NaOH$ C) NH_4OH and HCl
 B) $HCOOH$ and $NaOH$ D) $NaOH$ and NH_4Cl
- Q.114 For the given reaction the rate equation for the forward reaction is



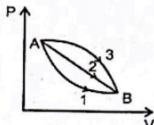
- A) $Rate = k \frac{[SO_3]^2}{[SO_2]^2 [O_2]}$ C) $Rate = k [SO_2]^2 [O_2]$
 B) $Rate = k [SO_2][O_2]$ D) $Rate = k [SO_3]^2$
- Q.115 The order of reaction is experimentally determined quantity and it provides information about.
 A) Mechanism of reaction C) Condition of reaction
 B) Rate of reaction D) Both a & b
- Q.116 By considering Arrhenius equation, straight line graph obtained between $\log k$ and
 (A) T (B) $\frac{1}{T}$ (C) \sqrt{T} (D) T^2
- Q.117 Half life of any reaction can be measured by using _____ formula
 A) $\left(\frac{t_1}{2}\right)_n \propto \frac{1}{a}$ C) $\left(\frac{t_1}{2}\right)_n \propto \frac{1}{a^n}$
 B) $\left(\frac{t_1}{2}\right)_n \propto \frac{1}{a^{n+1}}$ D) $\left(\frac{t_1}{2}\right)_n \propto \frac{1}{a^{n-1}}$
- Q.118 The value of equilibrium constant K_c for the given reaction
 $N_{2(g)} + O_{2(g)} \rightleftharpoons 2NO_{(g)}$ is 1.6×10^{-9} at $800^\circ C$ what will be the value of K_p for this reaction.
 A) 3.2×10^{-9} C) 8.0×10^{-9}
 B) 6.4×10^{-9} D) 1.6×10^{-9}
- Q.119 In Lead chamber Process, the catalyst is
 A) NO_2 C) N_2O
 B) NO D) N_2O_5
- Q.120 According to VSEPR Theory, $SnCl_2$ belong to
 A) AB_2 system C) AB_4 system
 B) AB_3 system D) AB_3E system

PHYSICS

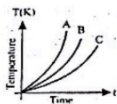
- Q.121 The number of antinodes between two successive nodes is
 A) 1 C) 2
 B) 3 D) 4
- Q.122 The fact that the universe is expanding is indicated by
 A) Red shift C) Both 'A' & 'B'
 B) Blue shift D) Yellow shift
- Q.123 A stretched wire is vibrating in fifth harmonic. The number of anti-nodes are
 A) 6 C) 5
 B) 4 D) 3
- Q.124 In an open-end pipe, first overtone is produced, when the length of pipe is
 A) $\lambda/4$ C) $\lambda/2$
 B) $\lambda/3$ D) λ



- Q.125** A given mass of a gas expands from state A to the state B by three paths 1, 2 and 3 as shown in the figure. If W_1 , W_2 and W_3 respectively be the work done by the gas along three paths then



- (a) $W_1 > W_2 > W_3$
(b) $W_1 = W_2 = W_3$
(c) $W_1 < W_2 < W_3$
(d) $W_1 < W_2$, $W_1 < W_3$
- Q.126** A tuning fork produces sound waves of wavelength λ in air. This sound is used to cause resonance in an air column, closed at one end and open at the other. The length of this column CANNOT be:
- A) $\lambda/4$
B) $3\lambda/4$
C) $2\lambda/4$
D) $5\lambda/4$
- Q.127** When an aero plane moves towards airport, then the frequency of reflected wave from the aeroplane received by radar
- A) Decreases
B) Remain some
C) Increases
D) Become zero
- Q.128** Consecutive harmonic frequencies of 100 Hz, 300 Hz and 500 Hz are produced in
- A) Stretched string
B) Closed end pipe
C) Open ends pipe
D) All of these
- Q.129** A standing wave is established in a stretched string which is 100 cm long with fundamental frequency f . If tension in the string is increased to double its fundamental frequency would become
- A) $2f$
B) $\sqrt{2}f$
C) $\frac{f}{2}$
D) $\frac{f}{\sqrt{2}}$
- Q.130** A stretched string resonates with fundamental frequency of 50 Hz. The wavelength for its 3rd overtone is if speed of transverse wave in the string is 100 ms^{-1}
- A) 66 cm
B) 50 cm
C) 33 cm
D) 100 cm
- Q.131** The frequency of the note emitted by a stretched string is 200 Hz. If tension in the string is increased by one-half without changing lengths of wire then frequency of the note will be
- A) $100\sqrt{2}$ Hz
B) $100\sqrt{3}$ Hz
C) $200\sqrt{2}$ Hz
D) $100\sqrt{6}$ Hz
- Q.132** In case of a moving source of sound which is moving away from an observer
- A) The wavelength of sound appears to be less
B) The wavelength of sound appears to be more
C) The wavelength of sound appears same
D) Frequency and wavelength of sound appears to be same
- Q.133** Which of the substances A, B or C has the highest specific heat? The temperature vs time graph is shown.



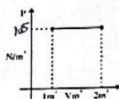
- A) A
B) B
C) C
D) All have equal specific heat
- Q.134** During an adiabatic expansion of 5 moles of gas, the internal energy decreases by 75 J. The work done during the process is
- A) -45 J
B) Zero
C) 15 J
D) 75 J



- Q.135 Distance and displacement traveled by a vibrating body in a time equal to $\frac{3}{4}T$; where T is the period of the vibration
A) $3x_0, 3x_0$ C) $3x_0, 0$
B) $3x_0, x_0$ D) $2x_0, 0$
- Q.136 The chasing car 'B' traveling at 20 ms^{-1} sounds a horn which the driver of leading car A travelling at 16 ms^{-1} estimate has frequency 340 Hz . The frequency which B's own driver hears ($v = 340 \text{ ms}^{-1}$)
A) 332 Hz C) 336 Hz
B) 334 Hz D) 338 Hz
- Q.137 In one end close pipe system of length 50 cm then wavelength for 3^{rd} mode of vibration when stationary wave is formed.
A) 66.6 cm C) 40 cm
B) 20 cm D) 33.3 cm
- Q.138 The length of a string is 1 m , tension in it is 40 N and mass of the string is 0.1 kg . Then the velocity of transverse waves produced in the string will be:
A) 400 ms^{-1} C) 80 ms^{-1}
B) 180 ms^{-1} D) 20 ms^{-1}
- Q.139 Doppler Effect is used to monitor blood flow through major arteries by ultrasound waves of frequency.
A) 5 Hz to 10 Hz C) 5 kHz to 10 kHz
B) 5 MHz to 10 MHz D) 5 GHz to 10 GHz
- Q.140 Two waves having same frequency travelling along same line in opposite direction, will produce
A) Interference C) Stationary waves
B) Beats D) Doppler's effect
- Q.141 The wavelength of wave is 1 m and period is 2 sec . Its speed is
A) 2 ms^{-1} C) 0.5 ms^{-1}
B) 5 ms^{-1} D) None of these
- Q.142 A pipe closed at one end has length 25 cm , the wavelength of first harmonic will be:
A) 25 cm C) 100 cm
B) 50 cm D) 200 cm
- Q.143 As $C_p - C_v = R$ shows that $C_p > C_v$. What is also true?
A) $\Delta T_p > \Delta T_v$ C) Both 'A' and 'B'
B) $\Delta U_p > \Delta U_v$ D) $\Delta U_p = \Delta U_v$
- Q.144 If an ideal gas is isothermally expanded, its internal energy
A) Decreases C) Remains same
B) Increases D) None of these
- Q.145 In an isothermal change an ideal gas obeys
A) Charles Law C) Both "A" and "B"
B) Boyle's Law D) None of these
- Q.146 For isothermal process
A) $Q = \Delta U + W$ C) $Q = W$
B) $Q = \Delta U - W$ D) $Q = \Delta U$
- Q.147 Which one is true for an adiabatic process?
A) $Q = W$ C) $Q = \Delta U$
B) $W = 0$ D) $W = -\Delta U$
- Q.148 A system does 600 J of work at the same time has its internal energy increased by 320 J . How much heat has been supplied.
A) 280 J C) 600 J
B) 920 J D) 20 J
- Q.149 Two gases A and B having same no of molecules are at temperature 10°C . A is heated at constant volume and B is heated at constant pressure and their temperature rises to 12°C . Increase in internal energy in
A) A is greater C) Both gases is same
B) B is greater D) A is slightly greater
- Q.150 The change in internal energy of two moles of a gas during adiabatic expansion is found to be -100 Joule . The work done during the process is
A) -100 Joule C) 100 Joule
B) 0 D) 200 Joule



Q.151 The work done is



- A) $3 \times 10^3 \text{ J}$
B) $2 \times 10^3 \text{ J}$
C) 10^5 J
D) Zero

Q.152 Three blocks, at temperature T_1 , T_2 and T_3 , are in good thermal contact.

T_1	T_2	T_3
Block 1	Block 2	Block 3

At which temperature are the blocks in thermal equilibrium?

- | | | | |
|----|----------------------|----------------------|----------------------|
| | $T_1/^\circ\text{C}$ | $T_2/^\circ\text{C}$ | $T_3/^\circ\text{C}$ |
| A) | 20 | 10 | 20 |
| B) | 20 | 20 | 20 |
| C) | 20 | 30 | 20 |
| D) | 30 | 20 | 10 |

Q.153 Which is not the example of adiabatic process?

- A) Rapid escape of air from burst tyre
B) Conversion of water into ice in a refrigerator
C) Rapid expansion of air
D) Cloud formation in the atmosphere

Q.154 Which is the process in which temperature of the system remains constant?

- A) Isobaric process
B) Isothermal process
C) Isochoric process
D) Adiabatic

Q.155 The difference between C_p and C_v is equal to:

- A) Planck's constant
B) Molar gas constant
C) General gas constant
D) Boltzman constant

Q.156 According to first law of thermodynamics the quantity which is conserved is:

- A) Force
B) Power
C) Momentum
D) Energy

Q.157 The relation between time period and frequency is:

- A) $f = 2\pi T$
B) $f = \frac{T}{2\pi}$
C) $f = \frac{1}{2\pi T}$
D) $f \times T = 1$

Q.158 The ratio of angular frequency and linear frequency is

- A) 2π
B) $\frac{1}{2\pi}$
C) π
D) $\frac{\pi}{2}$

Q.159 10 waves pass through the medium in one second with speed of 10 m/s. The wavelength of waves is:

- A) 1m
B) 20m
C) 10m
D) 100m

Q.160 The speed of sound in air depends upon

- A) Temperature
B) Density
C) Humidity
D) All of these

Q.161 Which one of the following media can transmit both transverse and longitudinal waves

- A) Solid
B) Gas
C) Liquid
D) Plasma

Q.162 The speed of sound has maximum value in

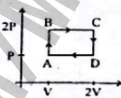
- A) Oxygen
B) Hydrogen
C) Air
D) Helium

Q.163 If the pressure of the gas is doubled, then the speed of sound

- A) Is also doubled
B) Is not affected
C) Becomes half
D) Increases by four times



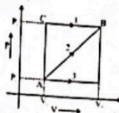
- Q.164** In order to produce beats, the two sound waves should have
A) The same amplitude
B) The same frequency
C) Slightly different amplitude
D) Slightly different frequencies
- Q.165** For isothermal change the equation will be
A) $PV^\gamma = \text{constant}$
B) $PV = \text{constant}$
C) $PV^{\gamma-1} = \text{constant}$
D) None of these
- Q.166** The portion of the wave above mean level is called
A) Node
B) Crest
C) Antinode
D) Trough
- Q.167** Beats can be heard when difference of frequency is not more than:
A) 8 Hz
B) 4 Hz
C) 10 Hz
D) 6 Hz
- Q.168** Increase in velocity of sound in air for 1°C rise in temperature is:
A) 0.61 cm s^{-1}
B) 0.61 m s^{-1}
C) 6.1 cm s^{-1}
D) 61 m s^{-1}
- Q.169** When two identical waves superimposed, which can change:
A) Wavelength
B) Velocity
C) Frequency
D) Amplitude
- Q.170** When one end of organ pipe is closed then frequency of stationary waves of any harmonic in it is given by
A) $f_n = \frac{nv}{2k\ell}$
B) $f_n = \frac{4v}{n\ell}$
C) $f_n = \frac{n\ell}{4v}$
D) $f_n = \frac{nv}{4\ell}$
- Q.171** At what temperature the speed of sound is doubled the speed at 10°C
A) 1132°C
B) 859°C
C) 859 K
D) 819°F
- Q.172** The work done during the cycle is



- A) PV
B) 2PV
C) 0
D) $\frac{PV}{2}$
- Q.173** For adiabatic change the equation will be
A) $PV^\gamma = \text{constant}$
B) $PV = \text{constant}$
C) $PV^{\gamma-1} = \text{constant}$
D) $P^\gamma V = \text{constant}$
- Q.174** For a monatomic gas $\frac{C_p}{C_v}$ is
A) 1.67
B) 1.33
C) 1.4
D) 1.5
- Q.175** In which process the P-V diagram is straight line parallel to volume axis?
A) Isobaric
B) Adiabatic
C) Isothermal
D) Irreversible
- Q.176** Radar stands for
A) Radio amplification detection and ranging
B) Radio waves destruction and re-engineering
C) Radio waves destruction and ranging
D) Radio waves amplitude development and aviation receiving



- Q.177 A system is taken from state A to B through three different paths 1, 2 and 3. The work done is maximum in



- A) Process 1
B) Process 2
C) Process 3
D) Equal in all processes
- Q.178 The apparent frequency of the whistle of an engine changes in the ratio 6:5 as engine passes a stationary observer. If the speed of sound is 352 m/s. Then the speed of engine will be
A) 22 m/s
B) 27 m/s
C) 32 m/s
D) 36 m/s
- Q.179 The velocity of sound in air is 330 ms^{-1} . The fundamental frequency of an organ pipe open at both ends and length 0.3 m will be.
A) 200 Hz
B) 300 Hz
C) 275 Hz
D) 550 Hz
- Q.180 The number of beats produced per second by two tuning forks when sounded together is 4. One of them has a frequency of 250 Hz. The frequency of the other cannot be less than
A) 254 Hz
B) 252 Hz
C) 248 Hz
D) 246 Hz

ENGLISH

- Q.181 The result of the treatment can affect the blood corpuscles and may even cause to death.
A) B) C) D)
- Q.182 During my college life, I was used to take exercise exclusively to be on the college hockey team.
A) B) C) D)
- Q.183 When the wearing of hats was made essentially compulsory, there were barely enough to go round.
A) B) C) D)
- Q.184 If it is fate that we are soon to be interrupted, let us to be found employing ourselves in something really appropriate.
A) B) C) D)
- Q.185 The problem was to find something that would only attack the germs.
A) B) C) D)

CORRECTION:

In each of the following questions, four alternative sentences are given. Choose the CORRECT one and fill the Circle corresponding to that letter in the MCQ Response Form.

- Q.186
A) All these concerns, apprehensions, and fears could rationally addressed.
B) All these concerns, apprehensions, and fears can be rationally addressed.
C) All these concerns, apprehensions, and fears can rationally address.
D) All these concerns, apprehensions, and fears can be rationally addressed at.
- Q.187
A) The modifications made by them in the draft were so drastic that the entire emphasis had been shifting.
B) The modifications made by them in the draft were so drastic that the entire emphasis was being shifted.
C) The modifications made by them in the draft were so drastic that the entire emphasis would have been shifted.
D) The modifications made by them in the draft were so drastic that the entire emphasis had shifted.
- Q.188
A) We had helped not only them with money but also with new machinery and raw material.
B) We had not only helped them with money but also with new machinery and raw material.
C) We had helped them not only with money but also with new machinery and raw material.
D) We not only had helped them with money but also with new machinery and raw material.



Q.189

- A) Apparently you didn't hear my broadcast, didn't you?
- B) Apparently you didn't hear my broadcast, did you?
- C) Apparently you didn't hear my broadcast, had you?
- D) Apparently you didn't hear my broadcast, hadn't you?

Q.190

- A) Although they were forbidden by Church law to marry, it was not unusual during the Middle Ages for priests to sire families.
- B) Having been forbidden by Church law to marry, it was not unusual for a priest during the Middle Ages to sire a family.
- C) Forbidden by Church law to marry, it was not unusual for a priest during the Middle Ages to sire a family.
- D) Although they were forbidden by Church law to marry, it was not unusual for a priest during the Middle Ages to sire a family.

Sentence Completion:

Fill in the blanks with appropriate word.

Q.191 Instead of panicking, she _____ untangled herself from some thorny vines and tried to stand.

- A) Crudely
- B) Apparently
- C) Haughtily
- D) Gingerly

Q.192 The study will _____ the effect of COVID 19 on the people; therefore, a massive campaign is being launched for the test.

- A) Evaluate
- B) Confine
- C) Attach
- D) Elaborate

Q.193 Democracy unchains us, whereas dictatorship puts in _____ our sacred right to life, liberty, and happiness.

- A) Exaggeration
- B) Jeopardy
- C) Junction
- D) Likelihood

Q.194 By _____ and thrift, laborers would have the chance to buy their own land.

- A) Confrontation
- B) Insinuation
- C) Industry
- D) Comprehension

Q.195 He usually sings at Christmas, but he has a _____ for getting out his piano at unexpected moments.

- A) Judgment
- B) Jeopardy
- C) Likelihood
- D) Knack

Synonyms

Choose the word that is most nearly **SIMILAR** in meaning to the word in capital letters.

Q.196 JUVENILE

- A) Merry
- B) Mellow
- C) Callous
- D) Pubescent

Q.197 INSINUATED

- A) Proclaimed
- B) Convinced
- C) Alluded
- D) Impelled

Q.198 HAPHAZARDLY

- A) Abruptly
- B) Strategically
- C) Daringly
- D) Indiscriminately

Antonyms

Choose the word **OPPOSITE** in meaning to CAPITALIZED word given above.

Q.199 GROGGY

- A) Bullied
- B) Bleary
- C) On guard
- D) On cloud nine

Q.200 FLICKED

- A) Scanned
- B) Glanced
- C) Battered
- D) Clattered

MCQ'S RESPONSE FORM

ID	A	B	C	D	ID	A	B	C	D	ID	A	B	C	D	ID	A	B	C	D
1					56					112					168				
2					57					113					169				
3					58					114					170				
4					59					115					171				
5					60					116					172				
6					61					117					173				
7					62					118					174				
8					63					119					175				
9					64					120					176				
10					65					121					177				
11					66					122					178				
12					67					123					179				
13					68					124					180				
14					69					125					181				
15					70					126					182				
16					71					127					183				
17					72					128					184				
18					73					129					185				
19					74					130					186				
20					75					131					187				
21					76					132					188				
22					77					133					189				
23					78					134					190				
24					79					135					191				
25					80					136					192				
26					81					137					193				
27					82					138					194				
28					83					139					195				
29					84					140					196				
30					85					141					197				
31					86					142					198				
32					87					143					199				
33					88					144					200				
34					89					145					201				
35					90					146					202				
36					91					147					203				
37					92					148					204				
38					93					149					205				
39					94					150					206				
40					95					151					207				
41					96					152					208				
42					97					153					209				
43					98					154					210				
44					99					155					211				
45					100					156					212				
46					101					157					213				
47					102					158					214				
48					103					159					215				
49					104					160					216				
50					105					161					217				
51					106					162					218				
52					107					163					219				
53					108					164					220				
54					109					165									
55					110					166									
					111					167									

Roll No.									
0	0	0	0	0	0	0	0	0	0
1	1	1	1	1	1	1	1	1	1
2	2	2	2	2	2	2	2	2	2
3	3	3	3	3	3	3	3	3	3
4	4	4	4	4	4	4	4	4	4
5	5	5	5	5	5	5	5	5	5
6	6	6	6	6	6	6	6	6	6
7	7	7	7	7	7	7	7	7	7
8	8	8	8	8	8	8	8	8	8
9	9	9	9	9	9	9	9	9	9

NAME: _____

FATHER'S NAME: _____

ROLL NO. (IN WORDS): _____

CANDIDATE'S SIGNATURE: _____

DEPUTY SUPDT. SIGN: _____

INSTRUCTIONS

- USE BLUE BALL POINT PEN ONLY.
 - PLEASE FILL IN THE ROLL NO. CORRECTLY.
 - IT IS IMPORTANT THAT THE CIRCLE IS FILLED COMPLETELY AND CORRECTLY AS SHOWN IN THE EXAMPLE BELOW, OTHERWISE THE UNIVERSITY CAN NOT BE HELD RESPONSIBLE.
- CORRECT EXAMPLE: ○ ● ○ ○ ✓
- INCORRECT EXAMPLES: ○ ● ● ○ X
○ ○ ● ○ X
○ ○ ○ ● X
- DO NOT ERASE A RESPONSE ONCE THE CIRCLE HAS BEEN FILLED IN.
 - INCOMPLETELY FILLED CIRCLES WILL NOT BE READ.
 - MULTIPLE RESPONSE TO ONE QUESTION IS NOT ALLOWED.
 - TEARING OFF THE RESPONSE FORM, FOLDING, STAPLING, CUTTING & PUTTING UNNECESSARY SIGNS AND IDENTIFICATION ON THE FORM WILL LEAD TO AUTOMATIC DISQUALIFICATION OF THE CANDIDATE.

THE UNIVERSITY SHALL NOT BE HELD RESPONSIBLE IF THE ABOVE INSTRUCTIONS ARE NOT FOLLOWED.